

Remarks/Arguments

Claim Summary

By this Amendment, 1, 3, 4 and 13 have been amended, and new claims 21-26 have been added for the Examiner's consideration.

Accordingly, claims 1-11 and 13-26 are now pending in the application.

35 U.S.C. ¶112, second paragraph

By this Amendment, claims 4 and 13 have been revised to improve the clarity thereof as requested by the Examiner. Further, new dependent claims 21 and 22 have been added which depend from claims 4 and 13, respectively.

It is believed that the rejection under 35 U.S.C. ¶112, second paragraph, has been overcome.

35 U.S.C. ¶102 and ¶103 – Carlstrom et al.

Claims 1-2, 4-11 and 20 were rejected under 35 U.S.C. ¶102 or ¶103 as being unpatentable over Carlstrom et al. ("Trimethylamine: Novel source for low damage reactive ion beam etching of InP", J.Vac. Sci. Technol. B 17(6), Nov/Dec 1999).

Without acquiescing to the reasoning underlying the Examiner's rejection, Applicants respectfully point out that Carlstrom et al. does not qualify as prior art against the present claims.

That is, Carlstrom et al. is not prior art under 35 U.S.C. ¶102(a) since the inventorship of the present application is identical to the authorship of the Carlstrom et al. article. Further, it is noted that Applicants' foreign priority applications (of record) pre-date the publication of the Carlstrom et al. article.

Further, Carlstrom et al. is not prior art under 35 U.S.C. ¶102(b) since it was not published more than one year prior to the International filing date (21 June 2000) of the present application.

35 U.S.C. ¶102 and ¶103 – Fujiwara et al.

Claims 1-11 and 13-20 were rejected under 35 U.S.C. ¶102 or ¶103 as being unpatentable over Fujiwara et al. (US 5534109). Applicants respectfully traverse this rejection with respect to the now pending claims 1-11 and 13-26.

Amended claim 1 refers to a method wherein the substrate is formed from groups II and VI elements. The specified material mentioned by Fujiwara does not contain a combination of these elements so that there cannot be any anticipation of the invention as defined in claim 1 by Fujiwara.

The method defined in claim 3 uses as the etching gas trimethylamine. Fujiwara does not propose the use of trimethylamine as an etching gas with the very specific substrate material used by Fujiwara. Again, therefore, there is not anticipation of the method defined in claim 3 by Fujiwara.

Claims 1 and 3 and the new claim 21 now include the explanatory statement that the etching method achieves enhanced etching of the group III (or II) materials, thus reducing the effect of preferential etching of the group V (or VI) elements in the compounds employed. Fujiwara does not have this as an objective or an achievement and thus the person skilled in the art would not be led to assume that Fujiwara in any way suggests a method of reducing the effect of preferential etching which is achieved by the particular choice of parameters of the method of the current invention.

In Fujiwara, the gas containing methyl groups is supplied is to improve selectivity between the pattern defining mask and the substrate. Column 1, lines 62 to 67: “it is an object of the present invention to provide a dry etching method in that the higher selectivity of an HgCdTe substrate versus a resist mask is obtainable. Removal of the resist mask after etching is easy, and the substrate can be selectively etched in a simple process and without damaging the substrate”. Column 2, lines 7 to 9: “further the higher selectivity of the

HgCdTe substrate versus the resist mask, which is 4 or higher, has been able to be secured”.

As stated in the present application, page 2 lines 13 to 21, “it is one object of the present invention to provide a method of etching with enhanced etching of the III elements, avoiding preferential etching of the V elements”. According to the present invention, there is provided a method of etching a substrate provided with pre-defined mask regions, whose elemental constituents are selected from groups III and V of the Periodic Table, which method provides free methyl radicals in a plasma environment using a gas including a methyl compound bonded to nitrogen”. Subsequent paragraphs described examples of the materials to be etched and also describe that the principle may be applied to II-VI materials.

The use of Fujiwara of methylamine or dimethylamine for the purpose of etching HgCdTe giving improved selectivity with respect to the material of the resist mask, would not lead someone skilled in the art to recognize that the use of gases containing methyl groups would help in the preferential etching problem described in the present application. Furthermore, Fujiwara is only concerned with a very limited process wherein a particular HgCdTe substrate is etched either a methylamine or a dimethylamine plasma.

For at least the reasons stated above, Applicants respectfully contend that claims 1-11 and 13-26 are neither anticipated by nor obvious in view of the teaching of Fujiwara et al.

Conclusion

No other issues remaining, reconsideration and favorable action upon the claims 1-11 and 13-26 now pending in the application are requested.

Respectfully submitted,

Volentine Francos, PLLC



Adam C. Volentine
Reg. No. 33,289

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One Freedom Square
11951 Freedom Drive, Suite 1260
Reston VA 20190
Tel. (703) 715-0870
Fax (703) 715-0877